

# A Story Worth Telling

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# Presentation Narrative

**U.S. Department of Energy  
Solar Decathlon 2020  
Build Competition**

**Kaikaiknong Crescent Development**  
*Presentation Narrative*  
*BC\_WH\_JURYPRES*  
*Submission Date: 03/02/21*

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## NEWS **Efficient 'Warrior Home' built for family at Cape** *See this Story Online →*



**Owen Sound Sun Times**  
Postmedia Network

## Introduction

The Chippewas of Nawash Unceded First Nations community located on the Neyaashiinigmiing Reserve in Southwestern Ontario forms an integral part of the rich tapestry that is Canada's indigenous heritage. Like many Indigenous communities, however, access to adequate housing for all of its members is often a large challenge and one that is not sufficiently addressed by provincial and federal governments. With growing families and the return of community members wishing to live on their lands, the demand for good-quality, affordable housing that meets the needs of each Chippewas of Nawash community member kept rising. As a result, Warrior Home's entry for the Solar Decathlon Build Challenge aimed to address the housing crisis present in Canada's Indigenous communities through the design and construction of a sustainable home that also addresses the cultural and societal needs of the homeowner and community.

From 2018 to 2020, Warrior Home has worked closely with the Chippewas of Nawash to design

and build a net-zero energy home that was made to accommodate the specific needs of the residents of the Neyaashiinigmiing Reserve. The team was able to partner with the Habitat for Humanity Grey Bruce to build a net-zero energy home in the Kaikaiknong Crescent development. After extensive consultation with community leaders, community members and the family that was set to receive the home, Warrior Home was able to develop an innovative and affordable design that integrates energy efficient technology, high-performance engineering systems as well as aesthetics, ergonomics, and Indigenous cultural integration. By December 2019, students and local volunteers were able to complete the construction of the Warrior Home design and a family of 5 was able to move in.

Throughout the entire project, Warrior Home never lost sight of its ultimate objective, which was to improve the lives of an Indigenous family through the construction of a sustainable, comfortable and affordable home. The team was able to successfully

convey, communicate, promote and present this objective. Warrior Home's successfully implemented communication strategy brought together students, the community members of the Neyaashiinigmiing Reserve, sponsors, partners, and the public through various communication methods. Throughout the 3 year competition, Warrior Home was also able to adapt to changing societal and communal situations to keep the project present and relevant for all stakeholders.

What fueled the team to complete the design and help build the net-zero energy home were ultimately the wonderful people in the community, which include the housing authority, Chief and Band Council, the homeowners, a mother named Melissa and her four kids, and many others met throughout the process. Their unique stories and needs propelled the design for the home, which itself contributed towards the promotion of sustainable development within First Nations communities.

# Strategy



**Figure 1**  
Communications Strategy & Visual Identity Guide Excerpt

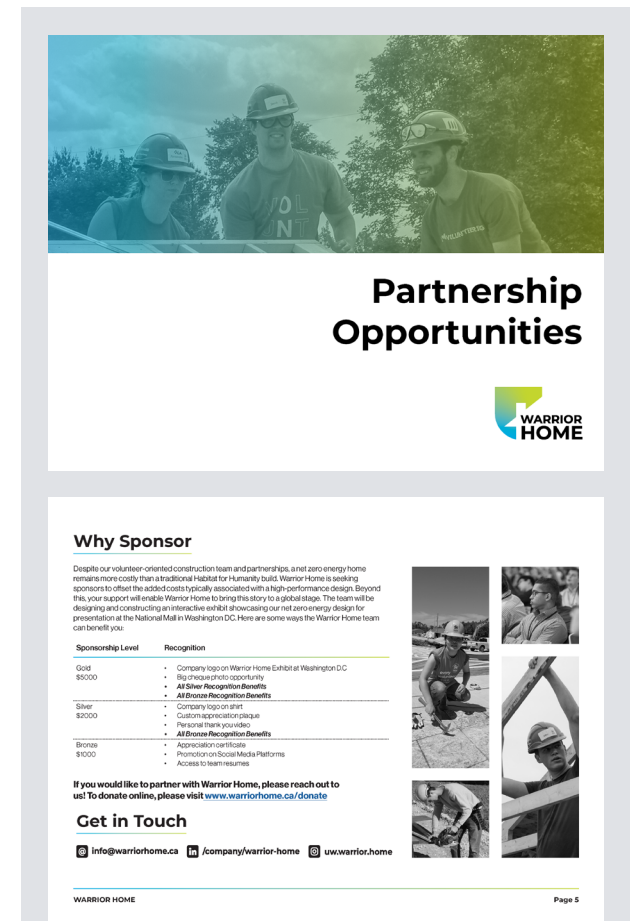
Warrior Home team undertook the initiative to create a comprehensive and well-integrated communications strategy (Figure 1); as part of that strategy, the team also developed a distinctive, consistent and cohesive visual identity (Figure 1).

Warrior Home's communication strategy and visual identity identified the relevant stakeholders of the project and laid out intuitive pathways for ensuring that these stakeholders were both reached and heard. At the onset of COVID-19, the team shifted towards dedicating greater resources to Warrior Home's online presence and social media and even created a virtual exhibition for the community at large to explore. Warrior Home also took advantage of the University of Waterloo's provision of the Microsoft Teams app to conduct regular events and meetings without interruption. Despite the presentation, communications and recruitment related challenges posed by COVID-19, the Warrior Home team was able to leverage a condensed timeline and team ingenuity to address all the necessary local build-related presentation requirements for the Solar Decathlon and thrive in the face of adversity.

The team was focused on attracting talented students from the University of Waterloo, delivering a moving and captivating narrative for our build to our supporters and the community at large and developing a unique and innovative way to present our project to the jury and competition. A Partnership Opportunities package was also created specifically with sponsors and partners in mind (Figure 3). Warrior Home also undertook a concerted effort to reach traditional media audiences such as local newspapers and professional magazines; these traditional media sources were targeted by Warrior Home as opportunities to reach out to a wider audience and to gain supporters in relevant affiliated industries.

The success of our integrative, stakeholder-centred design process, the consistency of our deliverables

and online presence, and the ease with which the team was able to overcome the communications related hurdles posed by COVID-19 is a testament to the success of Warrior Home's communication strategy.



**Figure 2**  
Partnership Opportunities Guide Excerpt



# Implementation

The Warrior Home team strived to deliver all presentations in a professional yet engaging manner. They were delivered by knowledgeable team leaders who were capable of answering all questions posed by the public. Depending on the stakeholder being engaged, a variety of presentation styles were used in-person as well as online; these presentation styles included powerpoints, videos, and spoken presentations (Figure 3). Throughout the development of the project, the team worked to engage the Chippewas of Nawash indigenous community in every step of the design and build.









**Figure 3**  
Warrior Home Team Members After a Presentation  
Image Source: Warrior Home

Warrior Home's design was created with consultation with the local community leaders and future homeowners to assess their individual needs and those of the build site. During the build and house tours conducted after the house was completed, the team engaged the local community to educate them about the different features of the house that make it more energy-efficient and unique.

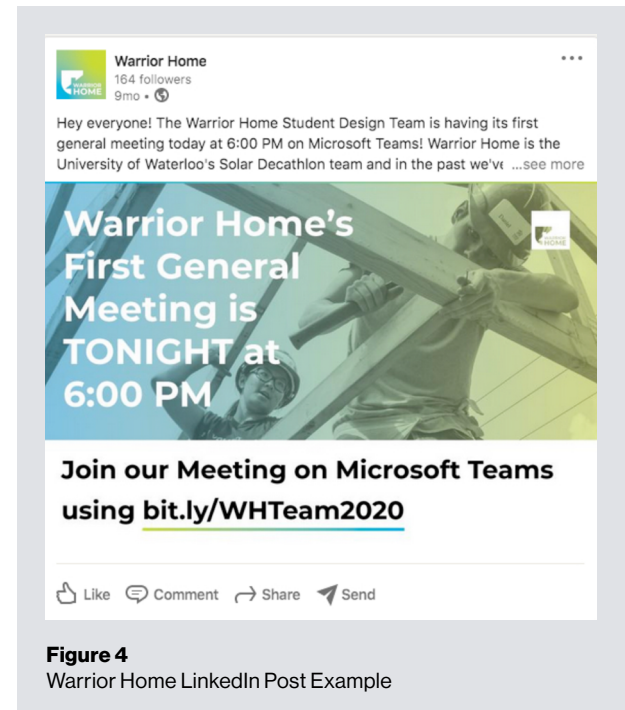
## Warrior Home

### Online:

-  **Website**  
*Visit [warriorhome.ca](http://warriorhome.ca) →*
-  **Email**  
*Email [info@warriorhome.ca](mailto:info@warriorhome.ca) →*
-  **Instagram**  
*@[uw.warrior.home](https://www.instagram.com/uw.warrior.home) →*
-  **LinkedIn**  
*/company/[warrior-home](https://www.linkedin.com/company/warrior-home) →*
-  **Microsoft Teams**  
*[bit.ly/WHTeam2020](https://bit.ly/WHTeam2020) →*
-  **Facebook**  
*/groups/[warriorhome](https://www.facebook.com/groups/warriorhome) →*
-  **Slack**  
*[warriorhome2020.slack.com](https://warriorhome2020.slack.com) →*



To be able to reach out to the public at large, the Warrior Home website as well as social media posters and banners were used to spread awareness of the group. Information regarding how to get involved with the group, as well as milestones achieved were also mentioned on these platforms, as well as LinkedIn (Figure 4). The use of LinkedIn allowed the group to gain professional attention; various local building science companies came to know of the Warrior Home and the various projects the group was pursuing. Thanks to this strong online presence, Warrior Home actually saw a sustained increase in student interest in the team and was able to see attendance rise across general meetings, seminars, and team building events.



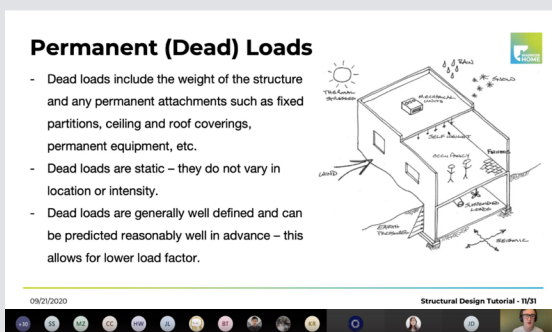
**Figure 4**  
Warrior Home LinkedIn Post Example

By using Facebook and Instagram (Figure 5), the number of participants in the bi-weekly meetings increased almost threefold. Thus, the use of various online and digital communication strategies has successfully contributed to engaging members of different audiences. Along with spreading awareness of net-zero homes and the team itself, another goal of the design group was to educate the public. Microsoft Teams was used to carry out educational seminars on net-zero building features which were advertised on Facebook, LinkedIn, and Instagram. The number of participants in the seminars was not affected despite the pandemic and in some cases, holding the seminars in the online format proved to be more popular. Seminars





**Figure 5**  
Warrior Home Instagram Post Example



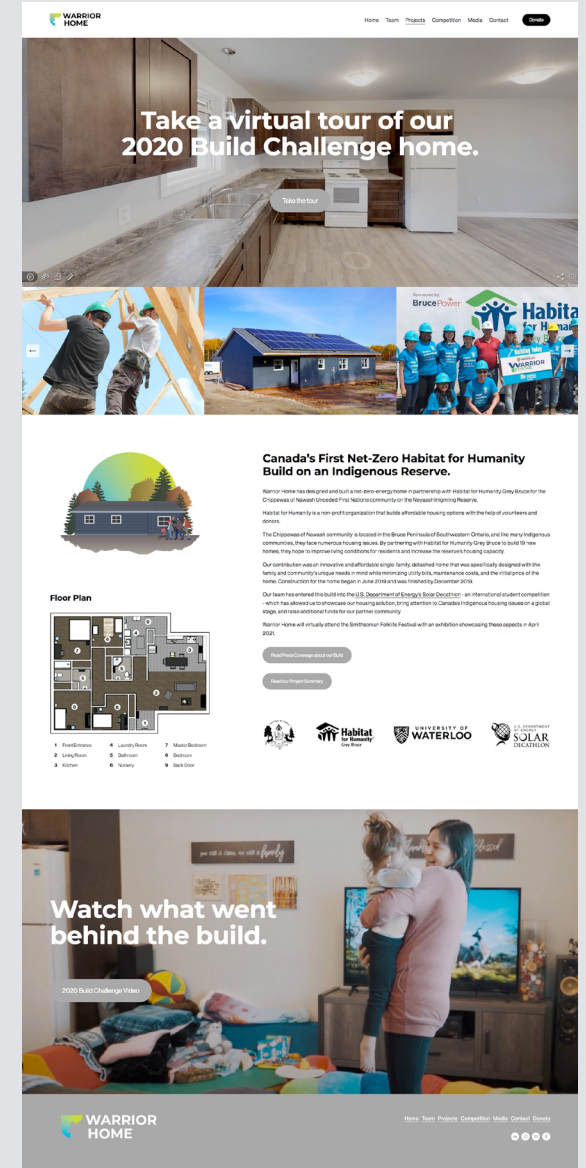
**Figure 6**  
Warrior Home Structural Seminar on MS Teams

were recorded to allow participants to revisit the presentation for future reference. Using Microsoft Teams was successful in engaging the audiences for educational purposes due to its user friendliness since participants could easily enroll themselves into sessions and actively participate (Figure 6).

Throughout the 3 year competition, Warrior Home has also engaged in coordinated efforts to reach the general public, potential sponsors and prospective team members through more traditional media outlets. These efforts included reaching out to local newspapers and radio stations in advance of our successful in-person tours held in 2019, as well as writing articles for the university's various media outlets and for professional magazines to attract prospective team members, sponsors and partners (Figure 8).

By creating a virtual tour of the home, people who were not able to physically visit the building were able to get a sense of its layout. By including this online aspect, a more holistic understanding of the home was shared with even more members of the community, resulting in higher engagement (Figure 7). This virtual tour would also have been beneficial had there not been a pandemic, since the semi-remote location of the reserve is hard to access by car and difficult to present to as large an audience as the virtual tour can. A 4 minute Youtube Video was produced showcasing the home (Figure 10).

However, in November of 2019, Warrior Home did host in-person educational tours of the home over several days and encouraged community engagement. Prior to the successful home tour, the Warrior Home website and social media posters and banners were used to spread awareness of the group. For the tour days, Warrior Home reached out to several media outlets to promote a wider range of media coverage. Information about the build was also covered and advertised by several news



**Figure 7**  
Warrior Home's Virtual Tour Page  
[Go to warriorhome.ca/2020-build-challenge](https://warriorhome.ca/2020-build-challenge) →



**Figure 9**  
Local News Coverage of Warrior Home  
Image Source: Postmedia Network



Construction manager Al MacDonald talks with Melissa Millette, right, who will be moving into the super-energy efficient 'Warrior Home' by early next year, built at Neyaashiinigmiing and designed by a University of Waterloo team which included Emily Osborn, left in white shirt, and Nicole Politis, beside her, on Saturday, Nov. 23, 2019 in Neyaashiinigmiing, Ont. Scott Dunn/The Owen Sound Sun Times/Postmedia Network

**The Following Local Newspapers & Radio Stations that Carried Similar Coverage:**  
Image Source: Bell Media, Bayshore Broadcasting & Blackburn Radio

OWEN SOUND  
**THE SUN TIMES** NORTH BAY NUGGET

**THE POST**

**92.5 The Dock**  
Greatest Hits



WILLOWDALE  
**THE INTELLIGENCER**

The  
**Timmins Times**

THE  
**SUDBURY STAR**

**560 CFOS**  
THE OLDIES YOU WANT.  
THE INFO YOU NEED.



**Figure 8**  
Coverage of the Warrior Home Project in the Ontario Professional Planners Institute Quarterly Magazine  
Image Source: Ontario Professional Planners Institute



**Figure 10**  
Warrior Home  
Youtube Video

Go to watch our  
video →



platforms including two articles from Owen Sounds, The Sun Times and an article on Blackburn News. Printed brochures offered during the tour provided a background on the team and the story behind the home, its layout, and Net-Zero features (Figure 9).



**Figure 11**  
A Warrior Home Team Members Guides a Guest Through the Tour Brochure During a Public Tour  
*Image Source: Warrior Home*

To manage the guests more easily and prevent excessive crowds and long lines, the house was divided into “stations” whereby the guests were able to effectively and efficiently self-guide themselves under the direction of the brochure and “floating” Warrior Home team member’s direction (Figure 11). Directional posters were also placed at key locations throughout the home to guide the guests

(See Appendix A for tour materials). At each station number highlighted on the brochure, several Warrior Home members were present to answer questions and provide information on the home’s different features. This informative event kept guests engaged and intrigued about the different sustainable- and design-related features built into the home (Figure 12).

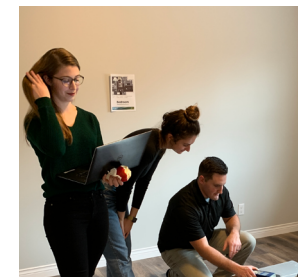


**Figure 12**  
Warrior Home Team Members Pose with the Homeowner and 3 of her Kids During a Public Tour  
*Image Source: Warrior Home*

During one of these tour days, a large house dedication ceremony was held for the future occupants with more than 600 people in attendance. The two large events coinciding on the same day ballooned interest in the home, and approximately 200+ people were able to physically experience and learn more about the home’s sustainable and energy efficient features. Feedback from the in-person tour guests suggested that they could easily understand the interior of the home as they walked through. The tour’s chosen date allowed for successful in-person tours to be possible but it also did require unique climatic conditions to be considered. The Warrior Home team planned ahead to ensure that the tours took place during a comfortable time of year before it started snowing. The team also ensured that the interior of the home was properly heated for the tour

guests and the team was also able to successfully guide the tour guests in a smooth and efficient manner to ensure that there was no line or people waiting outside in the cold. Finally, the team also took the necessary precautions to ensure that the floors of the home were well-protected when guests arrived wearing boots and outdoor shoes.

## Team Uniform



Team  
Canada



***Our goal is to build energy efficient, affordable, safe and healthy homes for our membership and this project has proven extremely successful to date. The success of this project has sparked interest from First Nations communities across Turtle Island.***



**Greg Nadjiwon**  
Chief, Chippewas of Nawash

## Conclusion

Overall, Warrior Home's successful implementation of an adaptable and resilient communication strategy was a strong factor in helping the team grow and remain relevant during a period of uncertainty. We are proud of the number of students, partners and community members we have been able to reach with our communication strategy and we consider it to be highly successful based on metrics such as strong recruitment, partnership development and brand awareness. A strong communications strategy and visual identity allowed the team to create a distinct and appealing brand, in conjunction with an active social media and web presence, allowed the team to successfully draw in partners and prospective team members and to keep them engaged throughout the 3 year competition.



*Designed and  
Built for an  
Affordable and  
Sustainable  
Future*



**This home felt like winning the lottery, it felt better than the lottery, I get to be closer to my mom, closer to my grandparents.**



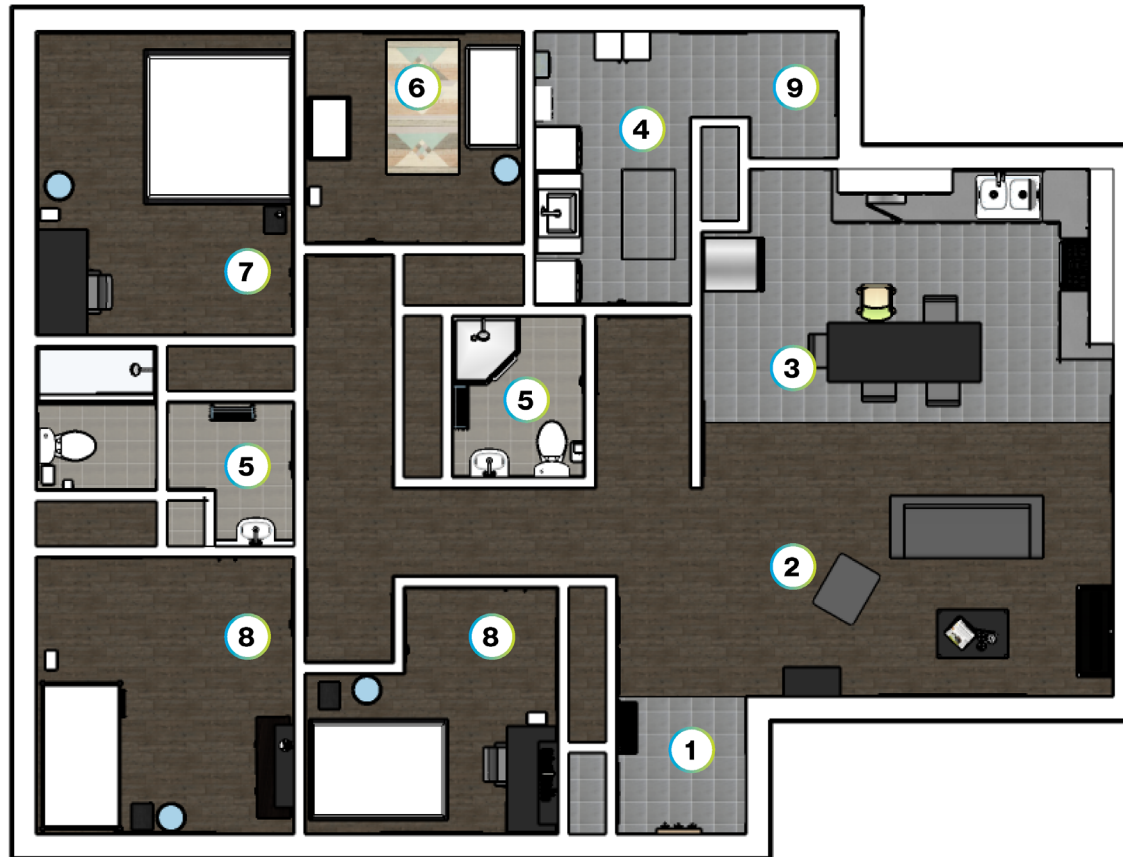
**Melissa Millette**  
Homeowner

# **Appendix A: Public Exhibit Materials**

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## Floorplan Poster



- |                  |                |            |                  |             |
|------------------|----------------|------------|------------------|-------------|
| 1 Front Entrance | 3 Kitchen      | 5 Bathroom | 7 Master Bedroom | 9 Back Door |
| 2 Living Room    | 4 Laundry Room | 6 Nursery  | 8 Bedroom        |             |

@ info@warriorhome.ca

in /company/warrior-home

@ uw.warrior.home



# Welcome!

See what's special about Warrior Home's design  
for Canada's first net-zero energy Habitat for  
Humanity build in an Indigenous Community



**WARRIOR  
HOME**

# Floorplans



- 1 Front Entrance 2 Kitchen 3 Bathroom 4 Master Bedroom 5 Back Door
- 6 Living Room 7 Laundry Room 8 Nursery 9 Bedroom

## Kitchen



- 1 Front Entrance 2 Kitchen 3 Bathroom 4 Master Bedroom 5 Back Door
- 6 Living Room 7 Laundry Room 8 Nursery 9 Bedroom

## Laundry Room



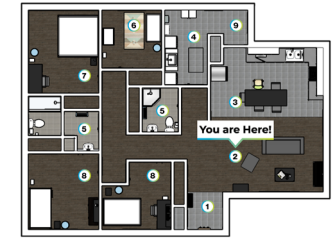
- 1 Front Entrance 2 Kitchen 3 Bathroom 4 Master Bedroom 5 Back Door
- 6 Living Room 7 Laundry Room 8 Nursery 9 Bedroom

## Nursery



- 1 Front Entrance 2 Kitchen 3 Bathroom 4 Master Bedroom 5 Back Door
- 6 Living Room 7 Laundry Room 8 Nursery 9 Bedroom

## Bedroom



- 1 Front Entrance 2 Kitchen 3 Bathroom 4 Master Bedroom 5 Back Door
- 6 Living Room 7 Laundry Room 8 Nursery 9 Bedroom

## Living Room



- 1 Front Entrance 2 Kitchen 3 Bathroom 4 Master Bedroom 5 Back Door
- 6 Living Room 7 Laundry Room 8 Nursery 9 Bedroom

## Bathroom



- 1 Front Entrance 2 Kitchen 3 Bathroom 4 Master Bedroom 5 Back Door
- 6 Living Room 7 Laundry Room 8 Nursery 9 Bedroom

## Bathroom



- 1 Front Entrance 2 Kitchen 3 Bathroom 4 Master Bedroom 5 Back Door
- 6 Living Room 7 Laundry Room 8 Nursery 9 Bedroom

## Bedroom

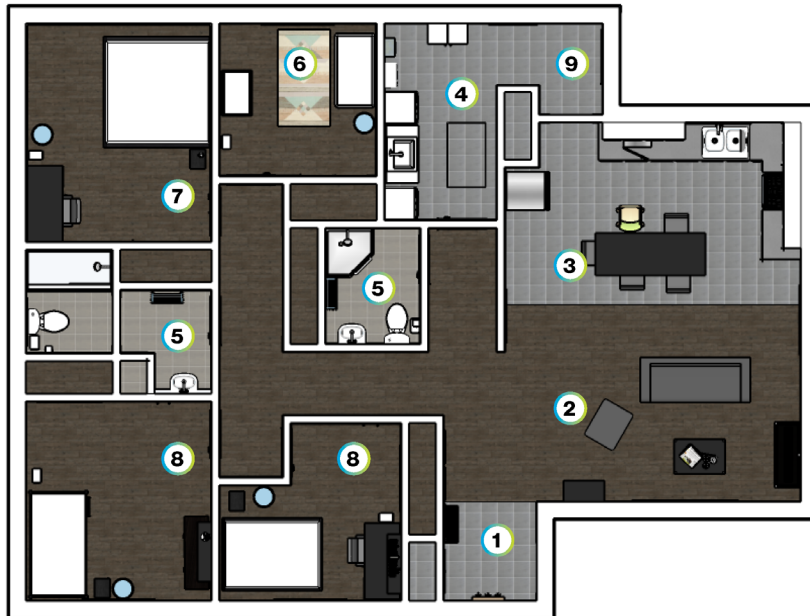


- 1 Front Entrance 2 Kitchen 3 Bathroom 4 Master Bedroom 5 Back Door
- 6 Living Room 7 Laundry Room 8 Nursery 9 Bedroom

## Bedroom



## Posters



- 1 Front Entrance 3 Kitchen 5 Bathroom 7 Master Bedroom 9 Back Door  
2 Living Room 4 Laundry Room 6 Nursery 8 Bedroom

# Welcome!



# You're Invited!

Warrior Home, the University of Waterloo's Solar Decathlon student competition team, invites you to a tour of our design for Canada's first net-zero energy Habitat for Humanity build in an Indigenous Community.

**November 23<sup>rd</sup>, 2019 | 2:00 PM**

Across the street from the Cozy Cats Bed & Breakfast on  
**Sydney Bay Road in Neyashiinigiing Reserve No.27**

For more information contact [info@warriorhome.ca](mailto:info@warriorhome.ca)







# Welcome!

See what's special about Warrior Home's design  
for Canada's first net-zero energy Habitat for  
Humanity build in an Indigenous Community



### The Warrior Home Design Team

Warrior Home is a multidisciplinary student design team at the University of Waterloo. With over 50 members spread out over two alternating co-op and school streams, Warrior Home's members represent a wide range of disciplines and faculties.

Warrior Home is an opportunity for some of the University of Waterloo's brightest and most compassionate thinkers and doers to devote their energy to developing sustainable and affordable housing. Warrior Home members are able to develop and share their building science, design, project management and social equity knowledge at each weekly meeting. They are then given the opportunity to apply this knowledge at volunteer build days with Habitat for Humanity Grey Bruce on the Neyaashiinigmiing reserve.

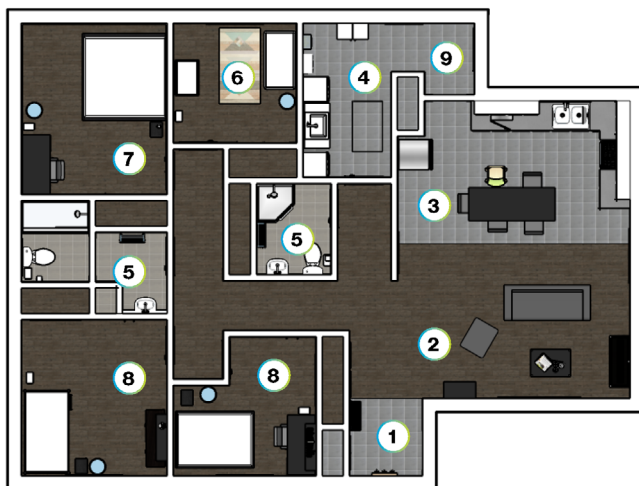
Warrior Home's design for a net-zero-energy home on the Neyaashiinigmiing Reserve was selected to compete in the 2020 Solar Decathlon Build Competition in the local build stream. Warrior Home is the only Canadian university represented at the Solar Decathlon Build Competition. The Solar Decathlon Build Competition is designed to challenge collegiate students who are interested in building science and civil engineering. Students from around the world compete to design net-zero energy homes with solar panels as their main energy source. After our home is complete, judges from the US Department of Energy will be sent to evaluate our build. In 2020, the Solar Decathlon Build Competition entries will be showcased at the Smithsonian Folklife Festival held in Washington, DC at the National Mall. Warrior Home will put together a mobile exhibit to bring to Washington DC in July 2020.



## Welcome!

Warrior Home is excited to show you inside Neyashiinigiing No.27's first net-zero energy Habitat for Humanity house! The first net-zero energy Habitat for Humanity build in an indigenous community. Warrior Home's design was constructed in partnership with Habitat for Humanity Grey Bruce and the Chippewas of Nawash. Designed and built with energy efficiency, sustainability, resilience and usability in mind, this new home is an innovative and affordable single family detached home molded around the community's needs while minimizing utility bills, maintenance costs and capital costs.

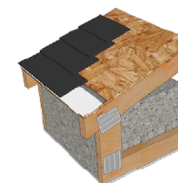
Explore inside to see what's different about this home! Read about our design process and how innovative upgrades to the home's systems were implemented.



- |                  |                |                  |
|------------------|----------------|------------------|
| 1 Front Entrance | 4 Laundry Room | 7 Master Bedroom |
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| 3 Kitchen        | 6 Nursery      | 9 Back Door      |

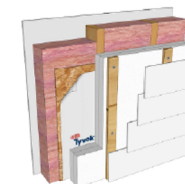
## Structural

Warrior Home's Design contains various structural novelties in its design. The roof is held up using "raised heel trusses", which elevate the connection between the wall top plates and the bottom chord of the roof truss. Doing this allows for more insulation to be inserted in attic space. The pitch of the roof truss was selected to be 5/12 to optimize the sunlight received by the solar panel.



## Building Envelope

The building envelope team has taken the time and given careful consideration to all aspects of the home's design. Everything from the roof to the concrete foundation was carefully evaluated to maximize the comfort and energy efficiency of the house. Raised heel trusses were selected in order to make room for additional insulation. All joints in exterior insulation were sealed to minimize air flow through the walls. Triple glazed windows with low-emissivity coatings were utilized to reduce solar heat gains. Insulated concrete form foundations were used to add additional thermal performance. These are just a few of the innovations incorporated in the design of the house.



## Interior Design & Landscape Architecture

The landscaping was designed with the environment and the local community in mind. Only native plants were used because they are low maintenance and sustainable. Many of the plants are edible for humans, and some are very good for the health of the ecosystem such as milkweed. Additionally, the design includes 2 rain barrels, which will collect water that falls onto the roof, and can be used to water the multiple gardens. Rain barrels reduce the demand from the municipal water supply and allow the relatively clean rain water to be re-used before returning to the groundwater through the soil or stormwater system. The water can be used for any outdoor purposes such as watering plants or washing cars. Overflow water from the rain barrels will flow into the rain garden. Rain gardens allow water to naturally filter through several sediment layers before returning to the groundwater, which reduces strain on

# Brochure

other drainage systems by reducing the volume they have to handle. Finally, to foster community, hardscaping such as a firepit and deck were included to provide a space where people can gather.

The Warrior Home house has the unique feature of an accessibility rail to aid one of the children in the family who has a visual impairment. Contrasting furniture and light paint colours are other ways we tailored our design for a visual impairment. We also considered wheelchair accessibility in our design of the furniture arrangement. In addition, creating a sense of community within the home impacted our design decisions.



## Plumbing

The plumbing system for the house uses a PEX home-run manifold system. Each fixture has a dedicated hot and/or cold water line running back to the manifold port. This differs from the usual trunk-and-branch approach to plumbing, and it is more efficient since the hot water is directly plumbed to each outlet. In a traditional system, a lot of water goes down the drain before hot water comes out, and in the manifold system it is more instantaneous. The manifold system also uses smaller diameter pipes, since each pipe only services one outlet, so it needs less energy to pump the water through the lines.

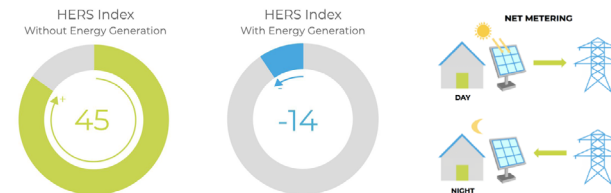
A hybrid-electric water heater tank was selected for the design, which offers the convenience and reliability of a water tank with superb efficiency, as it is paired with a heat pump. In addition to heating the water with electrical resistance, the heat pump draws heat from the surrounding air and uses a compressor and refrigerant to heat the water with the ambient heat. It has an efficiency factor of 3.7 and is estimated to save up to \$404 annually on the electricity bill.

WARRIOR HOME

Page 4

## Energy

The Kaikaikong Crescent Development will harness the sun's energy using solar panels to power the home. This energy source is safe, resilient, environmentally friendly, and produces zero emissions. The solar panels will create clean energy for the homeowners. Since the solar panels produce more energy than the home consumes, the remaining energy will be used to create a more sustainable grid.



Using innovative strategies and design, this home was built to use 50% less energy than a conventional home of the same size. Through interactive and consumer friendly technologies, the homeowner can gain awareness of their energy footprint and strive to minimize their energy usage. This reduces the environmental impact of the home. Most importantly, it provides an opportunity for developing an energy conscious community.



Page 5

WARRIOR HOME



### Mechanical

The HVAC system consists of a central heat pump system coupled with a heat recovery ventilator (HRV). Heat pumps are highly energy efficient. By transferring heat from the outdoors instead of producing it, they can provide more energy output than the electric power used for operation. They can also switch between operating in heating mode and cooling mode, essentially providing two units in one package. Heat pump technology has been around for a while; it's the same type of system used in your refrigerator or air conditioner!

The HRV ventilates the home by supplying the proper amount of fresh air into the space and exhausting stale air from areas with high heat and humidity, like bathrooms. This improves the overall indoor air quality of the home, making the air more pleasant to breathe. Additionally, the HRV uses the otherwise wasted outgoing air to pre-heat or pre-cool the incoming fresh air. This means that less work is required from the heat pump to condition that air, improving energy efficiency.

The system is controlled using a Nest Thermostat. This thermostat allows the occupant to set schedules from an app, and can be changed from anywhere.. For example, if everyone is at their workplace during the weekdays, the thermostat could be scheduled to reduce the indoor temperature during working hours. The heat pump then does less work during those hours, reducing energy consumption and energy bills. When the occupants return home in the evening, the thermostat can be scheduled to raise the indoor temperature back to normal. Since the occupants are not in the home during those times, they gain the energy and monetary benefits without any noticeable change to their lifestyle.

### Thank You for Visiting!

If you would like more information on Warrior Home, or if you would like to partner with us, please reach out to us!

@ info@warriorhome.ca

in /company/warrior-home

@ uw.warrior.home



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